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The Ohio Cooperative Corn Performance Tests

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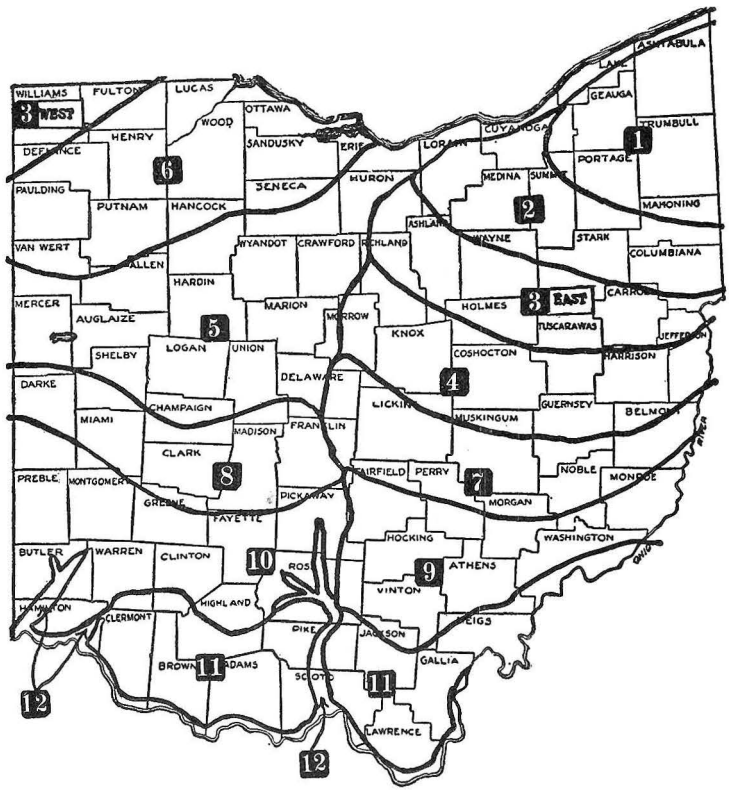
Ohio Agricultural Experiment Station

Cooperating with

51 Ohio seed growers and county seed corn associations, the Division of Cereal Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture, and the Agricultural Extension Service, The Ohio State University

OHIO AGRICULTURAL EXPERIMENT STATION
WOOSTER, OHIO



Adaptation areas for corn hybrids in Ohio

Refer to this map to locate the adaptation areas indicated in the list of tests and cooperators and in the table headings.

The areas are arranged with regard to climatic, soil, and corn usage variations. In general, the effective corn growing season is shortest in Area 1 and increases in length as the area numbers are higher. Wide variations exist, however, within areas, and these local variations must be considered in choosing adapted hybrids for specific farms.

THE 1940 OHIO COOPERATIVE CORN PERFORMANCE TESTS

G. H. STRINGFIELD, R. D. LEWIS, AND H. L. PFAFF[1] [2]

This circular presents the results of the Ohio Cooperative Corn Performance Tests for 1940, the third season of these tests. The results for previous seasons will be found in Ohio Agricultural Experiment Station Agronomy Mimeograph No. 50, 1938, and Special Circular No. 59, 1939.

The 1940 project originally included 51 tests conducted by farmers or seed growers and 9 on Experiment Station or County Experiment Farms, a total of 60. Fifteen were discarded because of ununiform growing conditions. Results from 45 tests are reported.

The 1940 growing season was generally less favorable for corn than either 1939 or 1938. An abnormally wet spring over the entire State was followed in most of the State by a serious drouth in July and August. Both conditions retarded corn development. Generally late ripening then was followed by poor drying weather in late September and October. The evaluation of the seasonal requirements of the strains is best made in such a season. Information obtained this year relative to seasonal requirements has provided a sound basis for extending the recommendations of some hybrids into areas with a shorter season than those for which they had previously been recommended.

CORN STRAINS TESTED

The 45 tests reported contained a total of 900 entries, 20 entries per test, made up from among 130 different strains. An entry constitutes one corn strain in a single testing field. The material included in the tests is classified in table 1.

Seed of 31 of the new Ohio experimental hybrids and of 9 other experimental combinations was produced by growers of certified hybrids on restricted acreages during the 1940 season and will be available for extended farm trials in 1941. Eight of these new combinations were included in the 1939 cooperative tests. Some others differ from one or more experimental hybrids tested in 1939 by the addition or change of only one inbred line. Thus, Ohio 20, (51A × 26) (33 × 40B), and Ohio 24, (51A × WF9) (33 × 40B), tested in 1940, differ from Ohio 1208, (33 × 40B) × 51A, tested in 1939, by the addition of inbred Ohio 26 and Indiana WF9, respectively, on one side of the cross; Ohio

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[2] The writers are much indebted to the farmers, seed growers, and hybrid seed corn associations who generously contributed land, fertilizers, labor, and personal efforts in conducting 51 of these tests; to the assisting personnel on State and County Experiment Farms; to L. L. Huber, Department of Entomology, for consultation and supervision of the insect phases of the work; to D. H. Bowman, Department of Plant Pathology, and the U. S. Bureau of Plant Industry, for consultation and help with disease problems; to D. F. Beard, Agricultural Extension Service, The Ohio State University, for consultation and help in supervising harvests; to The Ohio State University graduate students in Agronomy, S. R. Aldrich, C. F. Genter, R. E. Kunze, R. W. McMillen, and J. W. Lambert, for aid in supervising harvests; to C. F. Genter, and Ida Shapiro, stenographer, for aid in computations; and to M. T. Jenkins, Principal Agronomist, Division of Cereal Crops and Diseases, Bureau of Plant Industry, U. S. Department of Agriculture, for helpful criticisms of the manuscript.

96, (28 × 187-2) (Hy × 07), tested in 1940, differs from Ohio 1040, (28 × 187-2) × 07, and Ohio 1125, (28 × 187-2) × Hy, tested in 1939, by the addition of Illinois Hy to 1040 and by the addition of Ohio 07 to 1125.

TABLE 1.—Classification of the material included in the 1940 Ohio Cooperative Corn Performance Tests

Material	Corn strains	Entries
New Ohio experimental hybrids	36	407
Experimental hybrids from U.S. Department of Agriculture and other experiment stations	14	42
Experimental single crosses	8	8
Ohio certified hybrids	17*	218
Other certified hybrids	13	54
Privately controlled hybrids	30†	103
Open-pollinated varieties	12	68
Totals	130	900

*Includes three Illinois hybrids, one Indiana hybrid, two Iowa hybrids, four U. S. hybrids, one privately controlled hybrid, and six Ohio hybrids.
†Not including one privately controlled certified hybrid.

The eight single crosses were included in Areas 1 and 2, where not many promising commercial hybrids were available for testing.

The 17 Ohio certified hybrids included 11 developed wholly or in part outside Ohio but certified in Ohio. Since this group had been widely tested in previous seasons, no attempt was made to include each combination in each of its recommended areas in 1940. Such a procedure would have seriously curtailed desirable testing of new and out-of-state hybrids.

Thirty-one privately controlled hybrids were included in the test. A hybrid is considered as privately controlled if it contains one or more inbred lines kept in the control of a private company or if the designation of its constituent inbred lines is not published by the seed producer. A fee of $6.00 per entry (one strain in one test) was charged for testing privately controlled hybrids, and such entries were accepted from all companies that submitted them.

Twelve open-pollinated varieties were included for comparison. It is already becoming somewhat difficult to obtain good seed of all the standard open-pollinated sorts. Their continued presence in field performance experiments, however, is worth considerable effort, because they serve as points of reference in measuring progress in corn improvement.

CONTROL STRAINS

Certain hybrids were systematically entered in each adaptation area as "control" strains. The list of "control" strains follows:

ADAPTATION AREAS	CONTROL STRAINS
1 and 2	Ohio M15 and Ohio K23
3 and 4	Ohio W17 and Ohio K35
5	Ohio W17 and U. S. 65
6	U. S. 65
7, 8, and 9	Iowa 939 and U. S. 44
10 and 11	U. S. 44 and U. S. 13
12	U. S. 13 and U. S. 102

With the possible exception of U. S. 102, an experimental hybrid, the adaptation and merit of each of these hybrids is well established. It is planned to continue these same "control" strains for no less than a 5-year period. It is impossible that each tested strain be compared directly in the same experiments with each competing strain in any one year, much less in 5 years. Each strain in a given area, however, can be given a rating which shows its performance relative to common "control" strains.

MATURITY GROUPS

As in 1939, the tests were divided into 17 maturity groups. Each group originally contained either three or four tests. The tests within each group had the same entries and were conducted in locations approximating the same effective growing season. The groups are lettered roughly in order of effective length of growing season from Group A, requiring the earliest corn strains, to Group T, requiring the latest. (See list of tests and grower cooperators.)

EXPERIMENTAL PROCEDURE

In each test, 20 entries in 5 replications of 2- by 10-hill plots were laid out in a modified Latin square of 5 ranges (20 plots side by side) and 5 blocks (4 plots wide by 5 plots long) at right angles to the ranges. Each entry was placed at random once in each range and once in each block.

Planting arrangements and seed packets were sent to the cooperating growers from the Experiment Station without identification of the strains. After September 1, each grower was given the identification of the strains in his test.

In planting the experiments, six seeds were dropped in each hill in two "jabs" of three each with specially made hand planters. Stands were thinned to three plants per hill. Cultural and fertilizer treatments were uniform over a given test. Plots at the margins of the experiments were provided normal competition by at least two border rows.

The mid-date of silking was estimated for each plot in 35 tests. The instructions were to visit the planting on alternate days after the first silks appeared, to count the number of plants on each plot having one-third or more plants in silk, to record the date of count and the number of plants in silk for such plots, but to make only one such record for each plot. Silking dates were computed only for those tests where these instructions were executed to the satisfaction of the Experiment Station. Meyers'[3] method was used in computing mid-silking dates from these records.

A general checkup on the project was made in late August. Grossly ununiform tests were discarded then, any irregularities in planting were noted, and the number of plants infested with aphid colonies was determined. Aphid infestation was unusually heavy on corn in 1940, and the information on aphid abundance on the different strains in these widely distributed plantings is being used to evaluate the relative susceptibility of the hybrids and their component inbred lines, to study the effect of aphids in reducing corn yields, and to investigate further the relation between aphid susceptibility and corn borer susceptibility.

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[3]Meyers, M. T. 1930. Determining date of silking in experiments with corn. Journal of American Society of Agronomy 22: 280-283, illus.

Where opportunity permitted, special observations were made by L. L. Huber on corn borer infestations and by D. H. Bowman on disease infections. These observations, however, are not included in this report.

The number of plants lodged because of failure of their roots to hold them erect, and the number of plants broken below the ear were counted just before harvest. These counts were used to compute the percentages of lodged and of broken plants.

A representative of the Experiment Station or State University supervised the harvesting of each test. The ears from each plot were weighed and recorded in pounds and tenths. A grain sample for a determination of moisture content was taken from each plot by shelling two rows of kernels from each ear harvested from four hills, the first and fifth hills of the first plot row and the third and seventh hills of the second plot row. The samples were placed at once in moistureproof bags and promptly delivered by express or car to the University or the Experiment Station for determinations of the moisture content of grain.

Acre yield and dry matter content of the ear corn at harvest were computed from the field weights of ear corn and the moisture content of the grain with the aid of a table prepared by the Iowa Agricultural Experiment Station. This table is based on a curve showing the distribution of moisture between the grain and cob in ear corn ranging in moisture content from 10 to 40 per cent. The curve was computed from a large number of determinations made in Iowa. The acre yields are reported in terms of shelled grain with 15½ per cent of moisture.

This method of computing acre yields ignores differences in shelling percentage. It requires much less labor, however, than methods which involve the determination of shelling percentage. Comparisons made by the Ohio Station have shown that it gives practically the same results as the more laborious methods.

Because of retarded growth and slow drying, the grain on some plots contained more than 40 per cent of moisture at harvest. Since the Iowa table does not cover corn having more than 40 per cent of moisture in the grain, it was necessary to extend the table or lose all information on yield for these plots. Fifty undamaged ears were harvested from two fields of Ohio K35. One field was planted late and one at normal planting time. The maturity of the ears ranged from the late milk stage to full maturity, and the ears field-dried to less than 30 per cent of moisture in the grain. Careful determinations were made on each ear of the moisture content of the grain and of the cob, and the ratio of absolute dry matter in the grain to green weight of the ear was computed. As a temporary expedient, the Iowa tables were extended by using charts of these data. That made it possible to estimate the acre grain yields and percentages of dry matter in ears at harvest for all the tests and all the strains harvested.

Plots having less than 80 per cent of a normal stand were discarded, and if a plot stood adjacent to a stand of less than 80 per cent, the row next to the thin stand was discarded. Aside from these discarded plots, field weights were corrected to the expected weights at normal stands. The correction factors were computed from 21 years of Wooster data on stand in relation to yield.

INTERPRETATION OF THE DATA

All yield data were analyzed statistically by using Fisher's[4] analysis of variance. At the foot of each yield column a figure labeled "significant differ-

[4]Fisher, R. A. 1932. Statistical Methods for Research Workers. Fourth Edition. Oliver and Boyd.

ence" is given. Unless the yields of two strains differ by as much as the significant difference, or more, there can be little confidence that one was really superior to the other under the conditions of that test or group of tests. Between two strains of equal yielding capacity, a yield difference as great as the significant difference would be expected once in 20 comparisons as a result of soil differences and other random variations in the test. It follows that unless strains do differ by at least as much as the significant difference, the odds favoring an inherent superiority of either strain are poorer than 19 to 1. The odds diminish rapidly as the differences are smaller.

One of the items which make it difficult to evaluate corn strains is that they may not respond alike to fluctuations in environment. Two strains may differ little in one location but much in another; or one may be superior in one location but inferior in another. Thus, strain A may be slightly more productive than strain B in one test but much more productive in another; or strain A may be more productive than strain B in one test, less productive than strain B in another. This differential response to environments was probably operating within all the maturity groups in 1940. In statistical jargon, such a differential response is called "strain × location interaction." Its influence in adding to the variation in yield test results can be isolated, and its significance can be stated in terms of odds. At the foot of each table that summarizes more than one test, it is stated whether this interaction is not significant (odds are poorer than 19 to 1 that a measurable interaction was in operation), is significant (odds are 19 to 1 or higher that it was operating), or is highly significant (odds are 99 to 1 or higher that it was operating). Differences in time, whether in season or merely in planting date, may influence the order in yields or other measures between strains as much as differences in location.

The necessary difference for significance as given for a group average is valid only for a combination of different growing conditions very similar to those sampled in the table, because the variance due to the strain × location interaction was eliminated before the necessary difference was computed. To arrive at a necessary difference for group averages which would apply to random locations, the variance due to interaction could not be eliminated, and it would also be required to have sampled many more locations, seasons, planting dates, and cultural practices.

List of tests and grower cooperators

Test No.	Adaptation area	Group	County	Cooperating group	Grower cooperator	Address
601*	1	A	Ashtabula		John Brown	R. 1, Austinburg
602	1	A	Trumbull		Trumbull Co. Exp. Farm	Cortland
603*	2	A	Summit	Summit-Portage Co. Hybrid Corn Growers	Howard M. Call	R. 3, Kent
604*	2	A	Medina	Medina Co. Hybrid Corn Growers Assn.	C. G. Bohley	R. 4, Medina
605	3 West	B	Williams	Williams-Defiance Hybrid Corn Growers Assn.	Paul Smith	R. 2, West Unity
606*	3 East	B	Ashland	Ashland Co. Hybrid Corn Growers	Kline Brothers	R. 4, Ashland
607*	3 East	B	Richland	Richland Co. Hybrid Corn Growers	Richard A. Boyce	R. 1, Mansfield
608	4	C	Jefferson	Jefferson Co. Hybrid Seed Corn Producers	O. H. Reynard	Dillonvale
609	4	C	Knox	Knox Co. Hybrid Seed Corn Producers	Paul Leedy	R. 1, Butler
610	3 East	C	Tuscarawas	Tuscarawas Co. Hybrid Corn Growers	Geo. B. Johnson	R. 1, Dover
611	3 East	C	Wayne		Ohio Agr. Exp. Sta.	Wooster
612	4	D	Coshocton	Coshocton Co. Hybrid Seed Corn Producers	Chester C. Pew	R. 3, Coshocton
613	5	D	Marion	Marion Co. Hybrid Seed Corn Producers	F. A. Davidson	R. 4, Marion
614	5	D	Morrow	Morrow Co. Hybrid Seed Corn Growers	W. R. Furbay	R. 2, Cardington
615*	5	D	Wyandot	Wyandot Co. Hybrid Corn Producers	Allen Stephan	R. 3, Forest
616	5	E	Erie	Erie Co. Certified Hybrid Seed Corn Growers Assn.	Fries Estate Farm, Carl Greinig, Mgr.	R. 2, Huron
617*	5	E	Huron	Huron Co. Hybrid Corn Growers	French Brothers	R. 3, Wakeman
618	5	E	Lake		H. L. Mantle	R. 1, Painesville
619	5	F	Allen	Allen Co. Hybrid Seed Corn Producers	Herr Brothers	R. 2, Bluffton
620	5	F	Auglaize	Auglaize Co. Hybrid Seed Corn Producers	C. M. Manchester	R. 1, Lakeview
621	5	F	Hardin	Hardin Co. Hybrid Corn Growers	Wayne Putnam & Sons	R. 1, Alger
622	5	F	Shelby	Shelby Co. Corn Hybrid Improvement Assn.	L. E. Marrs	R. 5, Sidney
623	5	G	Mercer	Mercer Co. Hybrid Corn Growers Assn.	LeRoy Pifer	R. 1, Rockford
624	6	G	Van Wert	Van Wert Corn Hybrid Assn.	Marsh Foundation, W. G. Weigle, Mgr.	Van Wert
625	6	G	Paulding	Paulding Co. Hybrid Corn Growers	Paul O. Eichling	R. 2, Paulding
626	6	G	Putnam	Putnam Co. Corn Hybrids Assn.	Jasper Pope	R. 3, Ottawa
627	6	H	Fulton	Fulton Co. Hybrid Corn Growers	John Neuenschwander	Wauseon
628	6	H	Henry		Northwestern Exp. Farm	Holgate
629	5	H	Seneca	Seneca Co. Hybrid Seed Corn Growers Assn.	Lester Utz	R. 1, New Washington
630	6	K	Hancock	Hancock Co. Hybrid Seed Corn Group	Wilbur Creighton	R. 5, Findlay
631	6	K	Lucas	Lucas Co. Hybrid Corn Growers	C. W. Mast	R. 1, Waterville

List of tests and grower cooperators—continued

Test No.	Adaptation area	Group	County	Cooperating group	Grower cooperator	Address
632	6	K	Sandusky	Sandusky Co. Hybrid Corn Growers	Gries & Bloom, and Floyd Damschroder	R. 4, Fremont R. 2, Gibsonburg
633	6	K	Wood	Wood Co. Hybrid Corn Growers	R. B. Waugh	Bowling Green
634	7	L	Belmont		Belmont Co. Exp. Farm	St. Clairsville
635†	7	L	Muskingum	Muskingum Co. Hybrid Corn Growers	T. F. Prosser	R. 1, Zanesville
636	5	L	Union	Union Co. Hybrid Seed Corn Producers	H. H. Coons	R. 1, Richwood
637†	8	M	Franklin	Franklin Co. Hybrid Seed Corn Producers Assn.	Erle Taylor & Sons	R. 2, Orient
638	7	M	Licking	Ohio Hybrid Seed Corn Producers	J. E. Van Fossen	R. 1, Croton
639	7	M	Perry		Ralph Yost	Thornville
640	8	N	Clark	Clark Co. Hybrid Seed Corn Producers	E. J. Kitchen & Son	R. 5, Springfield
641	8	N	Darke	Darke Co. Seed Improvement Assn.	Lowell H. Lephart	R. 4, Greenville
642	8	N	Madison	Madison Co. Hybrid Seed Corn Producers	Madison Co. Exp. Farm	London
643	8	N	Miami	Miami Co. Hybrid Seed Corn Producers	Miami Co. Exp. Farm	Troy
644	9	P	Fairfield	Fairfield Co. Hybrid Corn Assn.	Herbert N. Ruff	R. 1, Amanda
645	10	P	Fayette	Fayette Co. Seed Improvement Assn.	Harold C. Mark	R. 2, Washington C. H.
646*	10	P	Pickaway	Pickaway Co. Hybrid Corn Growers	Roger Hedges	R. 1, Ashville
647	10	P	Ross	Ross Co. Hybrid Corn Growers	Ralph Whaley	Frankfort
648*	10	Q	Butler	Butler Co. Hybrid Corn Growers	Paul P. Mohr	Oxford
649	10	Q	Preble	Preble Co. Hybrid Seed Corn Assn.	Mason Montgomery & Sons	R. 1, Eaton
650*	10	Q	Warren	Warren Co. Hybrid Corn Growers	Earl Sams	R. 2, Lebanon
651	10	R	Hamilton		Hamilton Co. Exp. Farm	Mt. Healthy
652	11	R	Highland		Meyers Hybrid Corn Co.	Hillsboro
653	10	R	Meigs		Southeastern Exp. Farm	Carpenter
654*	11	S	Adams	Adams Co. Hybrid Corn Growers	M. W. McCarty	Winchester
655	11	S	Clermont		Clermont Co. Exp. Farm	Batavia
656*	11	S	Gallia		Rio Grande College Farm, C. T. Shaipton, Professor of Agriculture	Rio Grande
657*	11	S	Jackson	Jackson Co. Hybrid Corn Growers	Jackson Co. Infirmary Farm, J. H. Steele, Supt.	Jackson
658	12	T	Butler	Butler Co. Hybrid Corn Growers	J. F. Clawson	R. 1, Hamilton
659	12	T	Hamilton		Pope Brothers	R. 2, Harrison
660	12	T	Ross	Ross Co. Hybrid Corn Growers	Wilbur Kidnocker	Chillicothe

*Test discarded because of ununiformity due to excessive or deficient moisture.
†Test not planted because of excessive spring moisture.

INDEX OF ENTRIES

*Available for extensive farm trial in 1941.

†Submitted by the Paul O. Eichling Farms, Paulding, Ohio, as E-40.

Hybrids certified in Ohio		
Ohio C14	(67 × Hy) (51 × 56)	4, 5, 6, 9, 10, 11, 13
Ohio M15	(26 × 51) (A × CC5) lot 1	2, 3
Ohio M15	(A × CC5) (26 × 51) lot 2	3
Ohio W17	(56 × 4-8) (51 × 84)	3 to 9, inc., 11
Ohio K23	(26 × 51) (65 × 84) lot 1	2, 3
Ohio K23	(65 × 84) (26 × 51) lot 2	3
Ohio L31	(10 × Tr) (67 × L317)	17
Ohio K35	(65 × 02) (26 × Hy)	2 to 7, inc., 9, 11
Ill. 172	(R4 × Hy) (A × 540)	9, 10
Ill. 384	(A × Hy) (WF9 × R4)	9, 10
Ill. 960	(R4 × Hy) (540 × L317)	17
Ind. 614	(A × Hy) (R4 × Tr)	14
Iowa 931	(L289 × CL447) (Os420 × Os426)	2, 3
Iowa 939	(L289 × I205) (Os420 × Os426)	3 to 7, inc., 9, 11, 12, 13, 14, 17
Pioneer 311A		3, 4, 5, 7, 8, 14
U. S. 13	(WF9 × 38-11) (Hy × L317)	12 to 18, inc.
U. S. 44	(187-2 × 4-8) (Hy × 540)	11 to 17, inc.
U. S. 52	(Hy × 67) (4-8 × 540)	7, 10, 11, 12
U. S. 65	(51 × 4-8) (Hy × 540)	4 to 11, inc., 14, 17
Illinois hybrids		
172	(R4 × Hy) (A × 540)	9, 10
200	(WF9 × 38-11) (K4 × L317)	18
384	(A × Hy) (WF9 × R4)	9, 10
448	(38-11 × KYS) (K4 × L317)	18
960	(R4 × Hy) (540 × L317)	17
Indiana hybrids		
416	(M14 × 90) (WF9 × Hy)	7
425	(A × 90) (WF9 × Hy)	7
431	(WF9 × Hy) (Os420 × Os426)	6, 8
608C	(WF9 × Hy) (A × Tr)	8, 10, 14
610	(A × L) (WF9 × Hy)	7, 11
613	(66 × Tr) (WF9 × Hy)	11
614	(A × Hy) (R4 × Tr)	14
632	(WF9 × Hy) (R4 × Tr)	10
842	(R4 × 38-11) (WF9 × Hy)	17
844	(Tr × 38-11) (WF9 × Hy)	16, 17
845	(R4 × 38-11) (Tr × Hy)	16
Iowa hybrids		
931	(L289 × CL447) (Os420 × Os426)	2, 3
939	(L289 × I205) (Os420 × Os426)	3 to 7, inc., 9, 11, 12, 13, 14, 17
Michigan hybrids		
21A		9
71095	(experimental)	9
70827	(experimental)	9
U. S. hybrids (yellow)		
13	(WF9 × 38-11) (Hy × L317)	12 to 18, inc.
44	(187-2 × 4-8) (Hy × 540)	11 to 17, inc.
52	(Hy × 67) (4-8 × 540)	7, 10, 11, 12
65	(51 × 4-8) (Hy × 540)	4 to 11, inc., 14, 17

85‡	(U. S. 2 × KYS) (U. S. 1 × U. S. 6)	18
86‡	(U. S. 5 × KYS) (U. S. 1 × U. S. 6)	18
99‡	(U. S. 2 × U. S. 3) (U. S. 5 × KYS)	18
102‡	(KYS × U. S. 7) (U. S. 5 × U. S. 6)	18
115‡	(U. S. 2 × U. S. 3) (U. S. 5 × U. S. 6)	18
262‡	(Hy × KYS) (U. S. 2 × U. S. 3)	18
264‡	(Hy × J7-2E) (U. S. 2 × U. S. 3)	18
265‡	(Hy × J8-6G) (U. S. 2 × U. S. 3)	18
282‡	(J7-2E × J8-6G) (U. S. 2 × U. S. 3)	18
U. S. hybrids (white)		
359‡	(11b × 23) (41 × 43)	18
360‡	(11b × JC33) (41 × 43)	18
361‡	(JC33 × 23) (41 × 43)	18
Crow's Hybrid Corn Co., Milford, Ill.		
501W (white)		8
Edward J. Funk & Sons, Kentland, Ind.		
Hoosier-Crost 422		9
Hoosier-Crost 616		13
Hoosier-Crost 668		9, 13
Hoosier-Crost 818		16
Hoosier-Crost 840		15
Hoosier-Crost 1005		16
Michael-Leonard Seed Co., Sioux City, Ia.		
Iowealth AQ		9, 10
Iowealth AQF		9
Iowealth 25		7, 10
Iowealth 28N		15
Iowealth 29A		13, 15
Iowealth 30		13
Ohio Pioneer Hybrid Corn Co., Yellow Springs, O.		
311A		3, 4, 5, 7, 8, 14
314		12, 14
322		4, 8
324		3, 5
332		16
333		12
353		2
F. D. Richey, Ashville, O.		
Richbred 381		15, 16
Richbred 442		14
Richbred 894		12
Richbred 1001		14
Richbred 1002		14
H. L. Stiegelmeier, Normal, Ill.		
38		17
901		14
904		15

‡Experimental hybrid.

TABLE 2.—Group A. Ohio Cooperative Corn Performance Tests. 1940

Adaptation Area 1

Experiment No.: 602A

Location: Cortland, Trumbull Co., Ohio

Strain	Acre yield	Dry matter in ears at harvest	Planting to silking	Lodged plants	Broken plants	Aphid infestation
	Bushels	*Per cent*	*Days*	*Per cent*	*Per cent*	*Per cent*
WF9 × 40B	84.0	68.0	80.4	0.0	4.5	68.1
26 × 40B	80.6	68.9	76.4	.0	.4	28.7
Ohio 24	75.0	69.4	78.2	.0	7.8	33.2
WF9 × 33	74.9	68.7	81.6	.0	1.1	71.2
M8-29 × 40B	73.2	69.7	78.6	.0	11.0	41.9
51A × 33	69.8	70.4	79.2	.0	32.9	10.7
26 × 33	69.2	69.8	76.8	.0	2.5	45.6
Ohio K35	69.1	69.6	78.0	.0	3.2	69.6
Ohio 20	67.8	69.9	76.0	.0	12.3	22.9
51A × 40B	67.7	69.0	78.6	.0	16.4	.0
Ohio 28	67.4	67.2	81.8	.0	2.4	54.9
Ohio 26	67.3	66.8	80.4	.0	11.4	62.6
Pioneer 353	66.2	69.9	80.0	.0	13.2	52.1
Ohio 34	64.5	70.0	76.8	1.0	15.6	48.3
Williams 60	64.3	68.3	83.4	.0	6.0	72.1
Ohio K23	62.6	69.5	78.0	.0	12.8	63.9
Ohio M15	62.1	70.0	77.0	.0	17.1	40.0
M8-29 × 33	61.9	70.1	79.6	.0	9.3	50.4
Iowa 931	61.4	69.1	80.0	.0	20.4	74.4
Medina Pride	48.9	70.8	77.3	5.5	31.3	29.8
Significant difference	6.7	.....	.....	.....	.....	.....

TABLE 3.—Group B. Ohio Cooperative Corn Performance Tests. 1940

One complete replication was discarded; four replications were harvested and reported.

Adaptation Area 3 West

Experiment No.: 605B

Location: West Unity, Williams Co., Ohio

Strain	Acre yield	Dry matter in ears at harvest	Planting to silking	Lodged plants	Broken plants	Aphid infestation
	Bushels	*Per cent*	*Days*	*Per cent*	*Per cent*	*Per cent*
Ohio W17	97.7	57.5	70.5	0.0	1.3	49.4
Ohio 28	95.0	54.2	70.3	.8	1.2	26.0
Pioneer 324	94.9	58.0	70.5	.0	2.1	34.6
Ohio 66	92.4	54.6	70.5	.0	1.7	40.3
Ohio 38	91.4	53.5	71.0	.0	3.3	48.1
Ohio K35	91.3	58.1	68.0	.0	.8	45.9
Pioneer 311A	91.3	57.9	71.3	.0	2.9	52.3
Iowa 939	91.1	57.1	69.5	.0	7.6	55.9
Ohio 24	91.0	57.0	68.0	.0	.0	16.5
Ohio 36	90.0	54.1	69.8	4.6	2.5	42.9
Ohio 34	89.5	59.5	67.3	2.5	1.7	23.8
Ohio 26	88.9	56.0	69.5	.0	2.1	26.0
Ohio 20	87.5	61.6	66.0	.0	3.8	10.2
Ohio M15 (lot 1)	87.4	63.3	66.8	.0	2.1	37.9
Ohio K23 (lot 2)	85.7	60.0	66.8	.0	2.1	39.7
Iowa 931	83.6	60.6	69.3	2.9	7.5	50.0
Ohio K23 (lot 1)	83.0	58.2	68.0	.0	1.7	48.7
Ohio M15 (lot 2)	82.4	60.6	68.0	.8	3.3	37.9
Cook	80.1	59.5	69.8	4.3	4.7	42.3
Yaggi	79.5	58.7	69.0	2.6	8.9	35.7
Significant difference	7.9	.....	.....	.....	.....	.....

TABLE 4.—Summary of Group C. Ohio Cooperative Corn Performance Tests. 1940

Adaptation Areas 3 East, 4

Experiment No.:	Location:
608C	Dillonvale, Jefferson Co., Ohio
609C	Butler, Knox Co., Ohio
610C	Dover, Tuscarawas Co., Ohio
611C	Wooster, Wayne Co., Ohio

Strain	Acre yield					Dry matter in ears at harvest	Planting to silking	Lodged plants	Broken plants	Aphid infestation
	Average	Exp. 608C	Exp. 609C	Exp. 610C	Exp. 611C					
	Bushels	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Per cent*	*Days*	*Per cent*	*Per cent*	*Per cent*
Ohio 38	105.9	116.5	73.3	108.0	125.9	66.7	73.9	6.7	1.0	19.5
Ohio 46	103.9	111.7	72.0	108.9	122.8	67.8	72.7	3.0	.7	19.6
Ohio 24	103.6	107.3	81.4	105.4	120.2	68.5	72.1	1.2	1.9	11.6
Ohio 36	103.2	109.7	78.3	99.2	125.7	68.6	73.3	9.1	1.4	26.6
Ohio 64	102.7	115.9	68.9	100.4	125.5	69.3	73.4	2.5	.7	20.1
Pioneer 322	102.3	108.2	71.4	101.5	128.2	68.7	74.6	5.7	2.8	28.8
Ohio 66	102.1	112.2	63.7	105.0	127.4	66.2	73.9	1.6	.7	28.8
Ohio 68	102.0	109.4	56.1	106.2	136.3	65.3	75.3	.4	.6	32.2
Iowa 939	100.6	105.2	66.1	107.6	123.4	68.0	73.3	7.7	3.0	26.0
Williams 50	99.9	102.8	67.7	99.2	129.8	64.6	78.4	3.2	1.2	25.7
Ohio W17	99.6	99.4	75.4	101.6	122.1	69.2	73.6	3.7	3.2	26.7
Ohio 26	99.3	104.5	69.8	101.2	121.8	67.8	73.3	4.2	2.8	18.4
Pioneer 311A	98.1	99.9	76.3	89.5	126.5	69.6	74.1	1.2	3.3	42.7
U. S. 65	98.0	104.0	76.5	107.3	104.0	68.3	75.7	3.5	1.7	17.6
Ohio 32	97.7	93.1	77.5	99.4	120.8	68.4	73.3	1.8	1.8	18.2
Ohio K35	94.6	102.0	71.7	98.6	106.1	69.9	71.2	2.7	1.5	37.8
Ohio C14	93.2	99.1	68.1	87.6	118.1	66.7	75.1	6.7	2.7	27.2
Ohio 20	92.0	93.9	78.3	91.1	104.8	71.7	69.9	1.4	2.6	11.7
Woodburn (Krauss)	80.4	82.4	59.2	84.6	95.4	69.2	72.6	31.3	5.4	33.1
Keller Yellow Dent	74.5	82.4*	53.1	73.2	89.4	71.4	73.1	23.1	11.0	26.0
Significant difference	6.6	9.2	8.5	12.1	8.2	.....	.....	.....	.....	.....

Days from planting to silking taken on Experiments 609C, 610C, and 611C only.
The strain × location interaction is highly significant.
*Four replications only.

TABLE 5.—Summary of Group D. Ohio Cooperative Corn Performance Tests. 1940

Adaptation Areas 4 and 5

Experiment No.:	Location:
612D	Coshocton, Coshocton Co., Ohio
613D	Marion, Marion Co., Ohio
614D	Cardington, Morrow Co., Ohio

Strain	Acre yield				Dry matter in ears at harvest	Planting to silking	Lodged plants	Broken plants	Aphid infestation
	Average	Exp. 612D	Exp. 613D	Exp. 614D					
	Bushels	*Bushels*	*Bushels*	*Bushels*	*Per cent*	*Days*	*Per cent*	*Per cent*	*Per cent*
Ohio 38	79.4	130.9	41.6	65.8	61.8	71.3	4.8	17.0	39.7
Ohio 28	78.1	111.5	54.0	68.7	62.5	69.5	1.0	20.1	27.3
Ohio 66	76.7	116.7	48.3	65.1	63.4	70.8	1.4	18.4	39.8
Ohio 3004	75.3	123.5	43.6	58.7	63.5	71.4	2.6	16.6	40.6
Ohio 48	75.3	120.1	43.1	62.7	60.9	71.3	3.4	14.4	38.0
U. S. 65	74.8	116.4	40.3	67.8	63.4	72.7	2.6	24.6	31.3
Ohio W17 (lot 1)	74.7	107.1	49.9	67.0	64.3	70.1	3.5	24.0	32.7
Pioneer 324	74.5	119.6	44.4	59.6	65.5	70.2	5.2	20.9	21.4
Ohio 24	74.5	109.0	46.8	67.6	65.1	67.9	.5	20.1	24.2
Ohio 26	72.5	112.9	44.9	59.6	63.7	69.6	3.5	16.1	29.6
Ohio K35	72.3	108.1	45.3	63.6	66.7	67.7	2.2	11.4	49.3
Pioneer 311A	71.9	112.3	38.1	65.4	65.5	71.0	2.7	23.1	37.1
Iowa 939	71.6	117.4	42.3	55.0	64.6	70.0	5.5	16.7	40.2
Ohio 36	70.8	112.6	47.5	52.3	63.5	68.8	4.4	18.0	34.8
Ohio 34	70.2	99.6	49.3	61.6	67.7	66.7	3.6	21.0	35.0
Ohio W17 (lot 2)	69.8	109.5	49.5	50.4	64.3	69.9	4.0	23.6	28.8
Ohio C14	69.0	110.0	47.7	49.2	61.4	71.6	11.4	23.1	29.3
Ohio 20	67.7	89.2	56.7	57.3	69.3	64.7	.8	21.4	23.4
Woodburn (Krauss)	61.8	96.7	38.2	50.4	65.2	67.6	15.8	26.0	42.6
Cook	59.6	102.6	29.1	47.1	66.7	70.2	11.6	25.5	38.2
Significant difference	5.5	9.2	9.1	8.0	.....	.....	.....	.....	.....

Days from planting to silking taken on Experiments 612D and 613D only.
The strain × location interaction is highly significant.

TABLE 6.—Summary of Group E. Ohio Cooperative Corn Performance Tests. 1940

Adaptation Area 5

Experiment No.: 616E, 618E

Location: Huron, Erie Co., Ohio; Painesville, Lake Co., Ohio

Strain	Acre yield			Dry matter in ears at harvest	Planting to silking	Lodged plants	Broken plants	Aphid infestation
	Average	Exp. 616E	Exp. 618E					
	Bushels	*Bushels*	*Bushels*	*Per cent*	*Days*	*Per cent*	*Per cent*	*Per cent*
Williams 11B	89.4	106.1	72.6	66.7	69.8	0.7	8.7	37.7
Ohio 76	87.4	104.0	70.7	66.7	66.3	1.4	3.4	25.2
Ohio 68	87.0	96.3	77.6	67.2	66.2	1.4	7.3	56.3
Ohio 48	86.6	99.9	73.3	67.9	65.0	3.5	7.0	30.8
Ohio 66	85.6	93.5	77.6	67.9	64.5	1.0	3.4	35.4
Ohio 38	84.3	95.3	73.2	67.8	65.3	2.5	6.7	46.3
Indiana 431	84.1	96.7	71.5	67.8	65.8	2.5	4.7	53.8
Ohio 28	83.8	102.5	65.0	67.7	65.0	.9	8.3	21.4
Ohio C14	81.8	97.5	66.1	67.4	65.8	6.3	13.0	22.3
Ohio 26	79.5	89.4	69.6	68.3	64.6	1.2	9.0	18.6
Iowa 939	79.3	92.4	66.2	68.0	65.3	4.4	11.3	39.7
Ohio 32	79.1	93.1	65.1	68.5	65.3	2.0	9.9	7.3
Ohio 36	78.8	91.1	66.4	68.1	63.7	1.4	6.7	29.2
U. S. 65	77.7	91.6	63.8	68.7	65.7	7.2	13.0	37.5
Ohio W17	77.6	90.9	64.3	67.9	66.0	4.5	11.9	32.4
Ohio 42	73.7	80.7	66.7	69.3	63.0	1.9	12.9	23.8
Ohio K35	70.4	78.5	62.2	69.0	63.0	1.7	6.9	57.2
Cook	62.6	80.7	44.5	69.2	64.4	16.2	21.9	38.6
Cook (stalk selection)	61.5	80.7	42.2	69.2	64.0	13.2	23.0	27.7
Woodburn (Krauss)	60.8	76.8	44.8	68.8	63.2	18.4	21.5	32.6
Significant difference	4.7	6.3	6.4	.....	.....	.....	.....	.....

Days from planting to silking and aphid infestation taken on Experiment 616E only.
The strain × location interaction is highly significant.

TABLE 7.—Summary of Group F. Ohio Cooperative Corn Performance Tests. 1940

Adaptation Area 5

Experiment No.:	Location:
619F	Bluffton, Allen Co., Ohio
620F	Lakeview, Auglaize Co., Ohio
621F	Alger, Hardin Co., Ohio
622F	Sidney, Shelby Co., Ohio

Strain	Acre yield					Dry matter in ears at harvest	Planting to silking	Lodged plants	Broken plants	Aphid infestation
	Average	Exp. 619F	Exp. 620F	Exp. 621F	Exp. 622F					
	Bushels	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Per cent*	*Days*	*Per cent*	*Per cent*	*Per cent*
Ohio 38	92.5	75.8*	114.2	100.0	80.0	72.1	69.4	1.2	3.2	24.3
Ohio 76	89.1	67.9	112.5	101.0	75.0	68.9	70.5	.7	1.9	13.3
Indiana 610	87.7	71.1*	110.0	95.9	73.6	71.1	69.4	.6	5.2	27.7
Ohio 30	86.8	74.4	102.4	93.9	76.3	71.3	69.0	.4	2.3	11.7
Ohio 28	83.5	67.6	99.3	91.1	75.9	70.8	69.9	.1	2.9	11.8
Iowealth 25	82.9	59.0	107.1	91.2	74.3	71.7	71.7	.4	10.0	15.2
Pioneer 311A	82.7	68.8*	101.2	92.5	68.3	75.6	68.9	.3	8.2	22.3
Ohio 68	82.4	64.1*	108.4	94.2	62.8	70.0	70.4	.0	4.8	31.1
Iowa 939	81.6	65.5	97.2	94.9	68.8	72.7	67.7	.7	9.2	23.5
U. S. 65	81.4	69.4*	102.0	87.1	66.9	73.2	70.0	.2	7.8	22.6
Indiana 425	81.4	66.8	102.1	89.5	67.3	71.6	69.8	.5	3.1	24.7
U. S. 52	81.3	60.4	116.7	88.2	59.9	71.3	71.5	.3	5.7	22.7
Indiana 416	79.7	63.0*	98.9	87.8	69.1	72.1	69.5	.2	4.2	26.0
Ohio W17	79.7	67.1*	95.8	83.4	72.3	71.5	69.6	.5	7.4	26.5
Ohio K35	79.4	66.3	91.8	86.7	72.9	75.1	66.3	.2	4.3	24.2
Ohio 3004	79.0	62.7*	100.2	86.6	66.3	71.4	69.6	.5	6.7	23.6
Ohio 66	76.6	58.3	95.4	88.6	64.2	71.8	68.5	.1	6.8	19.2
Ohio 32	72.2	61.5	85.7	78.4	63.2	71.9	69.9	.0	4.5	11.8
Ohio 42	70.6	59.2	80.3	76.3	66.4	73.3	66.1	.1	8.5	15.8
Woodburn (Krauss)	63.0	43.6	81.4	69.3	57.6	73.4	67.5	3.5	13.8	22.8
Significant difference	5.6	12.1	9.7	5.5	11.2					

Days from planting to silking taken on Experiments 619F, 620F, and 621F only.
The strain × location interaction is not significant.
*Four replications only.

TABLE 8.—Summary of Group G. Ohio Cooperative Corn Performance Tests. 1940

Adaptation Areas 5 and 6

Experiment No.:	Location:
623G	Rockford, Mercer Co., Ohio
624G	Van Wert, Van Wert Co., Ohio
625G	Paulding, Paulding Co., Ohio
626G	Ottawa, Putnam Co., Ohio

Strain	Acre yield					Dry matter in ears at harvest	Planting to silking	Lodged plants	Broken plants	Aphid infestation
	Average	Exp. 623G	Exp. 624G	Exp. 625G	Exp. 626G					
	Bushels	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Per cent*	*Days*	*Per cent*	*Per cent*	*Per cent*
Ohio 86	84.5	86.0	88.6	86.0*	77.4	64.4	71.7	0.7	7.4	17.1
Ohio 84	76.9	82.2	72.8	78.6	74.0	64.7	72.6	.0	4.6	19.4
Ohio 38	75.3	77.3	78.2	72.5*	73.0	65.6	69.8	1.6	4.8	31.0
Ohio 65-1	74.6	76.7	72.9	73.6	75.0	67.5	71.3	.3	6.5	36.6
U. S. 65	74.5	79.7	78.6	70.3	69.2	67.3	70.5	.9	10.7	32.8
Indiana 608C	72.7	79.8	81.8	67.9*	61.1	65.9	69.8	.6	5.9	40.7
Ohio 30	71.9	69.6	71.9	74.0*	72.1	66.1	69.6	.3	3.6	24.4
Pioneer 322	71.5	81.7	72.7	68.6	63.1	69.2	68.7	.0	11.1	33.6
Ohio 76	71.5	68.2	76.6	66.2*	75.0	63.6	71.0	.3	3.9	22.6
Ohio 36	68.1	69.0	71.5	69.7*	62.3	67.5	68.4	1.5	5.4	27.9
Pioneer 311A	67.5	64.7	73.1	72.0	60.3	71.2	69.0	.3	9.5	38.7
Ohio 28	66.9	67.9	66.0	66.6	67.1	66.0	69.7	.7	5.4	23.4
Ohio W17	66.4	68.8	65.9	69.6	61.4	68.2	69.5	.4	11.3	33.3
Ohio 3027	65.9	73.5	64.2	67.3	58.4	69.9	68.6	.8	17.5	35.4
Ohio C14-1	65.0	66.8	63.0	64.9	65.1	66.9	69.3	.0	6.8	25.2
Indiana 431	64.9	75.7	63.8	58.6	61.5	66.4	69.9	.1	6.9	36.8
Ohio 48	62.8	64.0	62.9	62.2	62.2	64.7	70.3	.1	4.6	31.4
Ohio 56	61.0	64.1	58.8	62.4*	58.7	67.3	68.9	.0	5.7	29.0
Crow 501W	58.6	63.6	67.2	53.0	50.5	63.5	74.5	3.5	5.7	33.9
Woodburn (Krauss)	43.3	50.0	44.9	41.5	36.7	70.0	68.0	4.0	14.3	28.1
Significant difference	5.0	11.7	5.4	6.8	8.3	.....	.....	.....	.....	.....

Lodged plants taken on Experiments 623G, 625G, and 626G only.
The strain × location interaction is highly significant.
*Four replications only.

TABLE 9.—Summary of Group H. Ohio Cooperative Corn Performance Tests. 1940

Adaptation Areas 5 and 6

Experiment No.:	Location:
627H	Wauseon, Fulton Co., Ohio
628H	Holgate, Henry Co., Ohio
629H	New Washington, Seneca Co., Ohio

Strain	Acre yield				Dry matter in ears at harvest	Planting to silking	Lodged plants	Broken plants	Aphid infestation
	Average	Exp. 627H	Exp. 628H	Exp. 629H					
	Bushels	*Bushels*	*Bushels*	*Bushels*	*Per cent*	*Days*	*Per cent*	*Per cent*	*Per cent*
Ohio 76	81.2	90.6	58.9	94.1	69.3	74.5	0.6	19.4	15.5
Iowealth AQ	77.2	89.2	55.4	86.9	71.2	76.1	3.2	29.5	8.2
Ohio W17	77.1	84.6	58.8	87.9	71.9	74.1	.5	36.7	15.3
U. S. 65	75.5	86.4	53.7	86.5	71.7	76.3	.6	34.6	14.7
Ohio C14-1	75.1	88.5	52.0	84.9	71.4	73.3	.6	33.3	20.2
Illinois 384	75.1	83.7	54.5	87.0	70.5	76.4	.2	26.7	15.4
Hoosier-Crost 668	75.1	78.7	58.8	87.8	68.9	77.3	1.2	30.3	15.1
Ohio 48	74.1	82.5	52.4	87.3	69.8	74.2	.2	22.0	17.3
Ohio C14	73.6	83.6	54.6	82.5	71.2	74.9	1.1	34.3	19.1
Illinois 172	72.8	80.5	55.6	82.2	72.0	75.4	.2	33.7	13.6
Michigan 71095	72.3	83.8*	53.1	80.0	72.8	73.1	.1	32.3	16.6
Hoosier-Crost 422	71.7	78.7	49.9	86.4	71.4	75.7	.1	26.8	25.7
Michigan 70827	70.7	80.5	49.8	81.9	73.3	75.3	2.3	38.8	15.1
Iowa 939	70.7	83.6*	50.5	78.0	72.2	72.9	.9	31.2	18.9
Iowealth AQF	68.2	75.1	51.7	77.9	73.3	73.4	.8	26.8	18.7
Ohio 66	67.9	65.8*	52.3	85.7	73.2	72.6	.0	30.0	31.3
Ohio K35	67.8	72.4	52.2	78.7	74.0	71.3	.0	18.4	40.9
Ohio 68	66.2	75.7	44.9	77.9	70.2	75.3	.0	18.0	25.6
Woodburn (Krauss)	57.4	70.4	37.4	64.3	73.2	72.7	11.3	30.3	31.8
Michigan 21A	57.0	64.6	37.9	68.6	73.6	71.7	3.9	39.9	34.5
Significant difference	6.1	9.3	8.1	10.0	.....	.....	.....	.....	.....

The strain × location interaction is not significant.
*Four replications only.

TABLE 10.—Summary of Group K. Ohio Cooperative Corn Performance Tests. 1940

Adaptation Area 6

Experiment No.:	Location:
630K	Findlay, Hancock Co., Ohio
631K	Waterville, Lucas Co., Ohio
632K	Fremont, Sandusky Co., Ohio
633K	Bowling Green, Wood Co., Ohio

Strain	Acre yield					Dry matter in ears at harvest	Planting to silking	Lodged plants	Broken plants	Aphid infestation
	Average	Exp. 630K	Exp. 631K	Exp. 632K	Exp. 633K					
	Bushels	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Per cent*	*Days*	*Per cent*	*Per cent*	*Per cent*
Ohio 84	96.3	85.6	97.2	100.5	102.0	68.6	68.8	0.3	2.9	9.1
Ohio 76	92.5	93.1	86.6	97.6	92.5	68.5	66.0	.3	3.4	21.2
Ohio 30	90.9	94.2	86.5	90.4	92.3	68.8	65.4	1.4	4.3	10.6
Ohio 50	90.3	89.0	89.8*	93.0	89.5*	69.0	66.1	.9	4.4	16.0
Ohio C14-1	88.2	84.2	83.0	98.3	87.3	68.7	66.0	.9	4.6	15.2
Indiana 632	87.7	81.7	80.3	92.7	96.1*	68.5	66.9	.6	5.0	19.5
Iowealth AQ	86.9	87.6	82.5	90.9	86.4*	68.9	67.6	.4	7.6	12.2
Iowealth 25	86.8	83.8	83.7	91.0	88.7	68.7	69.1	1.7	9.1	17.6
Ohio 38	86.7	82.8	89.2*	90.0	84.8	69.3	64.5	1.0	4.2	28.0
Ohio C14	86.5	83.3	80.0	92.3	90.5	68.3	67.0	1.0	5.0	10.8
U. S. 65	86.4	83.2	82.8	87.8	91.8	69.4	67.3	1.3	10.0	18.4
Illinois 384	85.7	77.7	83.6	91.6	90.0*	69.5	67.0	1.5	5.3	20.1
U. S. 52	85.2	72.8	82.6	98.3	86.9	68.5	69.1	.2	6.6	26.8
Ohio 48	85.2	83.4	83.7	87.6	86.0	68.3	65.9	.6	4.2	21.7
Indiana 608C	83.6	80.1	77.2	88.4	88.8	68.9	66.1	.8	6.0	24.0
Illinois 172	83.5	82.0	80.4*	84.5	86.9	69.8	66.6	.7	11.1	15.9
Ohio 62	80.6	74.6	80.1	84.9	82.8	69.0	66.8	.5	9.7	11.7
Ohio 46	79.4	84.0	74.7	79.3	79.7	70.4	64.5	.7	6.1	16.1
Ohio 36	78.9	83.6	76.9*	75.2	79.9	70.1	64.2	1.6	5.6	22.3
Woodburn (Krauss)	60.5	59.3	54.6*	72.0	56.2	70.2	65.5	9.6	13.6	28.3
Significant difference	4.8	6.9	10.8	8.9	9.0	.....	.....	.....	.....	.....

The strain × location interaction is significant.
*Four replications only.

TABLE 11.—Summary of Group L. Ohio Cooperative Corn Performance Tests. 1940

Adaptation Areas 5 and 7

Experiment No.:	Location:
634L	St. Clairsville, Belmont Co., Ohio
636L	Richwood, Union Co., Ohio

Strain	Acre yield			Dry matter in ears at harvest	Planting to silking	Lodged plants	Broken plants	Aphid infestation
	Average	Exp. 634L	Exp. 636L					
	Bushels	*Bushels*	*Bushels*	*Per cent*	*Days*	*Per cent*	*Per cent*	*Per cent*
Ohio 36	81.1	74.9	87.3	67.8	75.1	15.9	4.2	74.1
U. S. 65	78.5	78.7	78.3	67.1	77.9	13.1	6.8	59.5
Ohio K35	78.1	84.3	71.8	69.8	74.4	4.6	3.9	68.8
Ohio 32	77.6	76.3	78.8*	67.1	75.7	20.7	7.9	53.6
Ohio 68	76.5	73.2	79.7*	61.9	77.4	6.8	5.7	64.3
Iowa 939	75.0	77.9	71.0	68.4	75.6	14.5	9.8	46.7
Ohio 76	75.0	68.5	81.4*	61.5	76.3	6.8	2.7	57.3
Ohio C14-1	74.6	69.7	79.5	63.9	77.3	17.4	6.6	56.4
Ohio 38	73.9	65.7	82.0	61.9	76.1	11.8	3.5	73.8
U. S. 44	73.2	66.7	79.7	62.6	78.0	15.0	4.8	68.5
Ohio C14	72.1	71.7	72.5	66.4	76.5	26.1	7.9	63.0
Indiana 610	70.3	61.9	78.7*	61.9	75.4	26.8	5.1	73.0
Ohio 46	70.2	70.5	69.9*	67.8	75.2	8.0	5.1	54.9
Ohio 34	68.5	66.6	70.4	70.5	74.1	13.3	5.3	65.5
U. S. 52	68.2	64.5	71.9	62.2	79.6	20.8	8.1	78.5
Ohio 64	67.7	66.2	69.1	68.7	75.1	8.2	5.8	49.7
Ohio 66	67.3	64.9	69.6†	66.6	74.4	4.7	10.0	57.0
Indiana 613	66.6	62.0	71.1*	61.1	77.2	23.0	5.8	59.4
Ohio W17	66.4	59.3	73.5*	64.1	76.3	24.9	19.8	63.1
Woodburn (Krauss)	61.4	62.9	59.9†	69.3	74.3	34.4	17.4	64.8
Significant difference	4.0	12.6	6.8	.....	.....	.....	.....	.....

Aphid infestation taken on Experiment 636L only.
The strain × location interaction is highly significant.
*Four replications only.
†Three replications only.

TABLE 12.—Summary of Group M. Ohio Cooperative Corn Performance Tests. 1940

Adaptation Areas 7 and 8

Experiment No.:	Location:
638M	Croton, Licking Co., Ohio
639M	Thornville, Perry Co., Ohio

Strain	Acre yield			Dry matter in ears at harvest	Planting to silking	Lodged plants	Broken plants	Aphid infestation
	Average	Exp. 638M	Exp. 639M					
	Bushels	*Bushels*	*Bushels*	*Per cent*	*Days*	*Per cent*	*Per cent*	*Per cent*
Ohio 84	79.7	101.9	57.5	59.7	80.0	0.5	1.0	40.0
Ohio 86	77.3	106.9	47.6	56.3	80.0	3.2	2.0	29.4
Ohio 38	77.0	97.4	56.5	60.1	77.0	6.4	3.7	45.2
U. S. 44	76.9	101.3	52.5	60.3	78.8	2.7	2.7	25.5
Ohio 48	76.2	97.9	54.5	58.7	77.2	4.9	3.6	46.8
Pioneer 333	75.3	101.0*	49.6	60.9	77.5	2.2	4.2	27.5
Ohio 76	75.0	91.5	58.5	59.0	77.4	.4	2.5	40.0
Ohio 82	75.0	99.9	50.1	58.0	79.2	.0	1.0	57.0
Ohio 96	74.9	100.8	48.9	57.5	80.1	.7	1.7	54.0
Ohio 88	74.6	97.3	51.9	57.1	78.6	3.6	2.4	43.3
Ohio 90	73.8	98.2	49.4*	59.5	78.6	4.6	1.6	68.2
U. S. 13	73.6	101.6	45.6	55.5	80.1	5.2	3.5	28.4
Iowa 939	71.2	87.6	54.7	63.2	76.4	5.1	7.2	35.1
Ohio 68	70.9	90.6	51.2	60.5	76.8	6.3	7.3	68.5
Ohio 36	69.8	87.1	52.4	62.5	76.0	.9	2.9	44.0
Ohio 66	68.8	83.0	54.5	61.7	76.0	6.3	10.6	35.1
Pioneer 314	67.9	85.9	49.9	60.7	79.2	2.0	2.8	42.7
Richbred 894	66.6	93.2	39.9	53.6	80.2	6.9	1.0	56.6
U. S. 52	66.5	88.3	44.7	60.7	79.6	1.5	6.4	29.1
Woodburn (Krauss)	56.3	67.1	45.4	64.6	75.6	31.1	16.0	28.5
Significant difference	9.2	12.2	8.0	.....	.....	.....	.....	.....

Days from planting to silking and aphid infestation taken on Experiment 638M only.
The strain × location interaction is highly significant.
*Four replications only.

TABLE 13.—Summary of Group N. Ohio Cooperative Corn Performance Tests. 1940

Adaptation Area 8

Experiment No.:	Location:
640N	Springfield, Clark Co., Ohio
641N	Greenville, Darke Co., Ohio
642N	London, Madison Co., Ohio
643N	Troy, Miami Co., Ohio

Strain	Acre yield					Dry matter in ears at harvest	Planting to silking	Lodged plants	Broken plants	Aphid infestation
	Average	Exp. 640N	Exp. 641N	Exp. 642N	Exp. 643N					
	Bushels	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Per cent*	*Days*	*Per cent*	*Per cent*	*Per cent*
Ohio 98	83.7	76.7*	72.9	83.7	101.4	65.9	78.9	17.2	1.4	33.6
Ohio 86	83.2	76.1	71.3	80.0	105.2	65.6	78.3	8.5	2.0	37.7
Ohio 88	80.6	70.1*	73.1	80.0	99.2	64.3	76.3	10.9	.5	46.3
Ohio 92	78.6	58.9*	78.8	78.0	98.8	64.3	77.7	2.1	.7	49.6
Hoosier-Crost 668	77.9	61.8	72.6	82.8	94.2	65.1	77.5	7.2	2.5	45.7
Ohio 82	77.8	51.0*	75.8	77.1	107.2	64.6	79.0	2.7	.4	50.5
U. S. 13	77.8	67.5	75.4	67.6	100.7	64.4	79.8	4.8	1.2	47.0
Ohio 90	76.7	56.4†	78.0	75.2	97.0	66.3	77.3	5.1	.6	43.7
Ohio 96	75.7	66.3*	70.7	71.1	94.8	65.6	78.7	7.7	.8	45.2
Ohio 76	75.5	62.9*	60.0	82.1	96.9	64.6	76.0	2.8	1.1	43.5
Ohio 80	74.7	62.8	65.8	68.1	102.0	64.7	77.4	3.6	1.2	45.6
U. S. 44	72.1	57.6*	69.1	69.6	91.9	66.7	78.1	3.9	2.8	52.5
Iowa 939	71.9	53.1	63.2	80.7	90.6	71.3	74.8	6.5	4.6	41.8
Ohio 62	70.4	58.5†	63.2	69.0	90.8	69.5	75.6	6.4	2.7	54.7
Hoosier-Crost 616	70.3	62.2	60.5	61.6	97.0	64.6	77.8	12.5	2.5	40.0
Ohio C14	69.7	60.5	58.0	74.4	85.8	68.0	76.7	9.3	2.3	43.3
Ohio 32	69.3	58.8*	56.3	80.0	82.0	70.3	75.9	2.3	4.0	40.4
Iowealth 29A	67.8	53.3*	66.5	53.3	98.1	63.6	80.5	9.2	1.9	46.6
Iowealth 30	64.1	62.4*	64.3	42.7	86.9	63.0	82.5	4.2	3.4	44.6
Woodburn (Krauss)	54.4	42.5	45.9	55.0	74.3	71.5	74.3	24.3	7.4	47.5
Significant difference	7.7	8.9‡	8.6	17.1	10.5	.....	.....	.....	.....	.....

Days from planting to silking taken on Experiments 640N, 642N, and 643N only.
The strain × location interaction is significant.
*Four replications only.
†Three replications only.
‡Assuming four replications.

TABLE 14.—Summary of Group P. Ohio Cooperative Corn Performance Tests. 1940

Adaptation Areas 9 and 10

Experiment No.:	Location:
644P	Amanda, Fairfield Co., Ohio
645P	Washington C. H., Fayette Co., Ohio
647P	Frankfort, Ross Co., Ohio

Strain	Acre yield				Dry matter in ears at harvest	Planting to silking	Lodged plants	Broken plants	Aphid infestation
	Average	Exp. 644P	Exp. 645P	Exp. 647P					
	Bushels	*Bushels*	*Bushels*	*Bushels*	*Per cent*	*Days*	*Per cent*	*Per cent*	*Per cent*
Ohio 98	80.4	70.9	81.6*	88.6	66.2	80.0	27.4	6.2	16.4
Ohio 80	76.1	59.2	85.6*	83.4	66.3	78.7	10.3	3.4	39.1
Stiegelmeier 901	74.1	56.9	82.1	83.3	66.1	78.2	27.5	7.6	30.5
Ohio 86	73.8	63.7	83.0	74.7	63.3	78.5	27.3	15.7	20.6
Ohio 92	72.7	55.3	80.7*	82.2	64.7	80.3	8.8	2.6	37.5
U. S. 13	71.9	56.3	83.1	76.3	64.2	78.0	20.8	7.3	33.6
Ohio 50	68.8	52.6	77.1*	76.7	65.4	79.6	19.4	5.7	29.7
Richbred 442	68.1	46.2	74.1	83.9	61.4	79.0	32.4	9.3	30.5
U. S. 44	67.8	51.2	75.0	77.2†	65.9	78.2	18.4	7.9	35.8
U. S. 65	66.1	49.9	72.0	76.3	68.5	76.7	20.0	12.3	29.8
Pioneer 314	63.8	48.9	71.1	71.5	67.9	78.0	22.7	8.3	34.5
Indiana 608C	63.8	53.8	72.1	65.5	66.1	76.2	13.5	9.6	32.1
Pioneer 311A	62.9	47.4	72.1	69.2	70.6	76.0	15.3	10.7	33.6
Indiana 614	62.3	52.8	65.8	68.4	67.3	76.7	13.7	12.1	30.1
Iowa 939	61.9	48.4	72.5	64.8	69.2	74.8	15.9	14.0	34.3
Richbred 1002	56.1	41.9	61.8	64.7	60.1	85.3	35.5	7.2	39.6
Richbred 1001	56.0	47.8	59.1	61.1	60.2	85.2	47.2	7.9	36.5
Clarage (Eichelberger)	50.4	32.5	61.3	57.3	64.1	80.4	42.5	8.9	28.3
Pale Yellow Dent (Ruff)	48.2	30.2	56.0	58.3	66.2	77.7	44.6	5.9	30.9
Reid (Ledwell)	45.2	34.7	48.2	52.7	61.5	83.4	38.2	7.8	29.3
Significant difference	6.1	10.6	5.4	9.4	.....	.....	.....	.....	.....

Days from planting to silking taken on Experiments 644P and 645P only.
The strain × location interaction is significant.
*Three replications only.
†Four replications only.

TABLE 15.—Group Q. Ohio Cooperative Corn Performance Tests. 1940

Adaptation Area 10

Experiment No.: 649Q

Location: Eaton, Preble Co., Ohio

Strain	Acre yield	Dry matter in ears at harvest	Planting to silking	Lodged plants	Broken plants	Aphid infestation
	Bushels	*Per cent*	*Days*	*Per cent*	*Per cent*	*Per cent*
Ohio 88*	96.0	62.9	74.0	1.2	0.0	47.9
Ohio 80†	89.7	62.8	73.4	1.7	.0	28.1
Ohio 86†	88.8	63.4	74.0	2.5	1.3	22.8
Ohio 96†	83.0	64.2	74.2	.9	.0	42.4
Ohio 82‡	82.6	61.0	75.0	.0	.0	33.9
Ohio 98†	81.7	62.5	76.4	13.9	3.5	29.1
Ohio 84*	81.0	62.0	75.4	.0	.0	27.1
Ohio 22†	80.7	60.2	75.4	1.3	.4	38.8
Ohio 92‡	79.7	60.8	76.8	.0	.0	44.2
U. S. 13	79.2	61.5	74.0	2.7	.3	37.8
Iowealth 29A†	79.1	61.4	74.6	4.2	2.5	32.2
U. S. 44†	77.7	63.5	75.2	.4	1.7	37.4
Richbred 38i†	75.8	58.3	74.2	.0	.4	45.7
Ohio 76†	74.7	61.0	73.6	.0	.4	31.6
Ohio 90†	74.7	64.3	73.6	.4	.8	35.3
Stiegelmeier 904*	74.2	60.9	75.6	1.8	.6	41.8
Hoosier-Crost 840‡	68.5	61.2	74.6	.0	.0	37.9
Iowealth 28N*	64.9	59.8	78.0	5.4	3.0	39.9
Reid (Ledwell)*	59.0	59.2	77.2	20.2	5.4	42.3
Clarage (Pudge)*	58.4	68.2	72.2	3.5	5.2	45.1
Significant differences§	9.6	.....	.....	.....	.....	.....

*Three replications only.
†Four replications only.
‡Two replications only.
§Assuming four replications.

TABLE 16.—Summary of Group R. Ohio Cooperative Corn Performance Tests. 1940

Adaptation Areas 10 and 11

Experiment No.:	Location:
651R	Mt. Healthy, Hamilton Co., Ohio
652R	Hillsboro, Highland Co., Ohio
653R	Carpenter, Meigs Co., Ohio

Strain	Acre yield				Dry matter in ears at harvest	Planting to silking	Lodged plants	Broken plants	Aphid infestation
	Average	Exp. 651R	Exp. 652R	Exp. 653R					
	Bushels	*Bushels*	*Bushels*	*Bushels*	*Per cent*	*Days*	*Per cent*	*Per cent*	*Per cent*
Ohio 12	77.6	80.1	65.1	87.7	68.8	76.0	36.5	3.6	10.9
Ohio 98	74.0	74.3	63.2	84.5	69.7	76.9	38.3	5.4	5.5
Ohio 86	73.6	74.0	68.0	78.9	68.7	75.9	35.3	7.0	8.5
Ohio 92	73.0	73.2	61.2	84.6	69.0	75.9	17.6	2.7	17.3
U. S. 13	72.4	70.8	65.3	81.2	67.9	76.1	22.0	3.4	16.6
Richbred 381	71.1	67.7	60.5	85.1	66.7	76.0	25.8	2.1	20.5
Pioneer 332	70.9	66.4	68.0	78.2	66.7	77.2	25.6	6.3	12.6
Ohio 88	70.5	68.5	61.4	81.6	67.7	75.2	23.7	3.2	13.1
Hoosier-Crost 818	70.0	69.2	65.3	75.5	68.1	75.4	21.5	12.2	12.4
Ohio 82	69.8	70.6	61.9	77.0	69.4	74.8	14.5	4.2	15.2
Hoosier-Crost 1005	68.5	63.5	57.3	84.8	66.6	77.2	34.0	5.9	12.3
Ohio 90	68.0	67.2	60.7	76.0	71.2	76.0	25.2	4.2	20.2
Indiana 844	66.7	63.3	53.4	83.4	67.7	76.3	22.7	5.6	16.4
Ohio 96	66.6	66.2	59.0	74.7	68.8	76.5	30.1	3.8	11.9
Ohio 22	64.7	67.5	54.9	81.8	68.5	78.6	21.2	1.4	13.2
Indiana 845	64.6	65.0	55.6	73.2	69.2	76.1	22.4	11.0	13.3
Ohio 84	63.9	60.8	62.8	68.0	68.5	76.6	28.6	7.1	10.3
U. S. 44	62.5	61.1	63.2	63.2	70.8	75.9	28.2	11.1	28.5
Clarage (Eichelberger)	49.3	44.9	47.8	55.3	69.5	78.1	36.3	12.2	24.7
Reid (Ledwell)	49.3	47.4	39.9	60.7	69.1	79.5	44.6	9.4	30.8
Significant difference	5.1	6.6	9.1	10.0	.....	.....	.....	.....	.....

Days from planting to silking taken on Experiments 651R and 653R only.
The strain × location interaction is not significant.

TABLE 17.—Group S. Ohio Cooperative Corn Performance Tests. 1940

Adaptation Area 11

Experiment No.: 655S

Location: Batavia, Clermont Co., Ohio

Strain	Acre yield	Dry matter in ears at harvest	Planting to silking	Lodged plants	Broken plants	Aphid infestation
	Bushels	*Per cent*	*Days*	*Per cent*	*Per cent*	*Per cent*
Ohio 12	56.5	72.1	79.0	0.0	0.4	39.3
U. S. 13	55.9	71.7	78.8	.0	.0	41.5
Ohio 98	54.8	70.8	81.2	.3	.0	21.0
Ohio 22	53.7	71.4	82.6	.0	.7	20.9
Ohio 88	53.6	69.3	79.8	.0	.0	40.4
Ohio 90	53.5	73.4	78.6	.4	.4	49.1
Ohio 92	52.9	71.2	80.6	.0	.3	38.4
Ohio 82	52.1	72.8	78.8	.0	.0	45.9
Ohio 86	51.0	71.2	80.0	.0	.7	26.5
Ohio 96	50.4	71.9	80.4	.4	.0	35.2
Stiegelmeier 38	48.7	72.1	80.0	.0	1.1	42.3
Indiana 842	48.7	71.9	80.0	.0	.0	46.6
Illinois 960	48.6	72.6	79.6	.7	.0	26.1
Indiana 844	47.0	69.6	80.2	.4	.0	42.8
U. S. 65	44.6	76.5	78.2	.0	1.0	41.0
Ohio L31	42.5	72.5	80.0	.7	1.4	40.8
U. S. 44	42.5	72.1	81.2	.0	.7	38.7
Iowa 939	38.9	78.9	77.0	.3	4.5	49.1
Steele Yellow Dent	33.1	69.6	84.4	2.9	1.5	36.6
Reid (Ledwell)	28.2	68.2	86.0	1.1	.7	36.6
Significant difference	5.4					

TABLE 18.—Summary of Group T. Ohio Cooperative Corn Performance Tests. 1940

Adaptation Area 12

Experiment No.:	Location:
658T	Hamilton, Butler Co., Ohio
659T	Harrison, Hamilton Co., Ohio
660T	Chillicothe, Ross Co., Ohio

Strain	Acre yield				Dry matter in ears at harvest	Planting to silking	Lodged plants	Broken plants	Aphid infestation
	Average	Exp. 658T	Exp. 659T	Exp. 660T					
	Bushels	*Bushels*	*Bushels*	*Bushels*	*Per cent*	*Days*	*Per cent*	*Per cent*	*Per cent*
Ohio 92	87.3	63.1	100.5	98.2	76.4	70.2	2.2	2.0	23.1
U. S. 13	84.5	60.2	99.5	93.9	74.5	72.4	2.9	3.8	21.1
Ohio 22	83.2	47.0	100.4	102.2	75.6	77.5	3.0	4.0	14.6
U. S. 102	81.9	47.3	97.9	100.4*	71.0	78.4	12.8	4.4	27.2
Ohio 3037	81.0	53.9	94.2	95.0	76.5	70.4	7.2	11.4	10.6
Illinois 200	80.0	42.4	102.8	94.8	74.5	77.8	5.9	3.2	20.8
U. S. 262	79.2	37.9	93.9	105.9	72.0	79.6	4.9	4.4	32.9
Ohio 1263	79.1	39.6	100.2	97.6	75.1	78.6	1.5	2.0	13.9
U. S. 265	78.3	36.0*	96.3	102.7	69.8	79.0	11.6	7.0	34.4
U. S. 264	77.8	41.1*	91.2	101.2	71.8	77.8	7.6	8.5	26.7
Illinois 448	77.6	44.6*	94.6	93.5	73.1	76.8	5.5	9.0	22.1
U. S. 360 (white)	77.2	33.9	98.6	99.0	73.1	79.8	12.6	4.1	22.0
U. S. 282	77.1	38.7*	91.9	100.7	68.8	78.8	27.3	4.8	34.9
U. S. 86	74.5	29.6†	94.6	99.3	69.5	80.3	18.2	6.6	26.3
U. S. 115	73.4	25.3†	96.7	98.2	69.9	79.3	15.3	10.1	35.1
U. S. 361 (white)	71.8	29.2	90.0	96.2	73.4	79.8	17.4	3.6	24.9
U. S. 359 (white)	70.5	29.6	88.3	93.5	70.1	80.0	10.1	2.1	28.3
U. S. 99	69.5	17.1†	88.7	102.6	68.2	81.7	11.4	5.0	33.1
U. S. 85	69.1	27.9*	83.6	95.8	70.2	81.3	12.0	9.7	23.4
White Dent (Kidnocker)	65.1	17.9	84.1	93.2	69.5	80.2	33.1	10.1	30.2
Significant difference	5.9	14.2	8.1	13.1	.....	.....	.....	.....	.....

Days from planting to silking taken on Experiment 658T only.
The strain × location interaction is highly significant.
*Four replications only.
†Three replications only.

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